

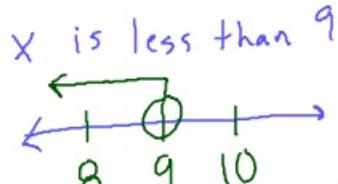
Notes

Solving Inequalities

$x <$
graph left
with an
open circle

$$(A) \quad \begin{array}{r} x + 3 < 12 \\ -3 \qquad \qquad -3 \\ \hline x < 9 \end{array}$$

$$\begin{array}{r} x+3=12 \\ -3 \qquad \qquad -3 \\ \hline x=9 \end{array}$$



$x >$
open circle
graph right

$$(B) \quad \begin{array}{r} 3x + 5 > -10 \\ -5 \qquad \qquad -5 \\ \hline 3x > -15 \end{array}$$

$$\begin{array}{r} \frac{3x}{3} > \frac{-15}{3} \\ x > -5 \end{array}$$

x is greater than -5

$x \leq$
graph left
closed circle

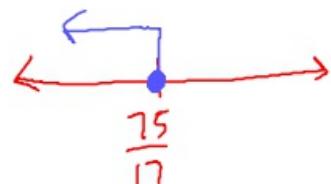
$$(C) \quad \cancel{\frac{2}{5}x - 10 + 3x \leq 5(5)}$$



$$\cancel{2x - 50 + 15x \leq 25}$$

$$\frac{17x}{17} \leq \frac{75}{17}$$

$$x \leq \frac{75}{17} \approx 4.41$$

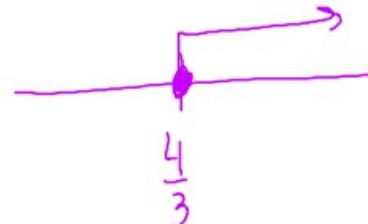


$x \geq 4$
*greater or
equal to
*graph right
*closed circle

$$(D) \quad 2(3x - 2) \geq 4$$

$$\begin{array}{r} 6x - 4 \geq 4 \\ +4 \qquad \qquad +4 \\ \hline 6x \geq 8 \end{array}$$

$$x \geq \frac{8}{6} \quad \boxed{x \geq \frac{4}{3}}$$



NOTES

* If you divide or multiply both sides by a negative you must reverse the inequality

$$(A) \frac{-2x > 4}{-2} \downarrow \quad x < -2$$

$$\begin{aligned} -2x &> 4 \\ -2(-3) &> 4 \\ 6 &> 4 \\ 6 \text{ is greater than } 4 \end{aligned}$$

$$(B) \cancel{3} \cdot \frac{-1}{3} x < 6(3)$$

$$\frac{-1x < 18}{-1} \downarrow \quad x > -18$$

$$(C) \cancel{3}(2x+1) \leq 5$$

$$\begin{aligned} -6x - 3 &\leq 5 \\ +3 &+3 \\ \hline -6x &\leq 8 \\ \cancel{-6} &\downarrow \\ x &\geq \frac{8}{-6} \\ &\downarrow \\ -8 &\quad \text{---} \\ 6 & \end{aligned}$$

$$\begin{aligned} -5x + 2 &\geq 7x + 1 \\ +5x &+5x \\ \hline 2 &\geq 12x + 1 \\ -1 &-1 \\ \hline \frac{1}{12} &\geq x \end{aligned}$$

x less than

$$\frac{1}{12} \geq x$$

$$\begin{aligned} -5x + 2 &\geq 7x + 1 \\ -7x &\cancel{-7x} \\ \hline -12x + 2 &\geq 1 \\ -2 &-2 \\ \hline -12x &\geq -1 \\ \cancel{-12} &\downarrow \\ x &\leq \frac{1}{12} \end{aligned}$$